

Title (en)  
LITHIUM SECONDARY BATTERY

Title (de)  
LITHIUMSEKUNDÄRBATTERIE

Title (fr)  
BATTERIE SECONDAIRE AU LITHIUM

Publication  
**EP 4024508 A4 20221228 (EN)**

Application  
**EP 20857673 A 20200728**

Priority  
• JP 2019159024 A 20190830  
• JP 2020028819 W 20200728

Abstract (en)  
[origin: EP4024508A1] A lithium secondary battery including a positive electrode, a negative electrode, a lithium ion conductive nonaqueous electrolyte, and a separator disposed between the positive electrode and the negative electrode; on the negative electrode, a lithium metal deposits at the time of charging, the lithium metal dissolves in the nonaqueous electrolyte at the time of discharging; the nonaqueous electrolyte contains a cation and an anion; the cation includes a lithium ion, and at least one cation X selected from the group consisting of Na, K, Rb, Cs, Fr, Mg, Ca, Sr, Ba, and Al; and the anion includes an oxalate complex anion Y.

IPC 8 full level  
**H01M 4/131** (2010.01); **H01M 4/40** (2006.01); **H01M 10/052** (2010.01); **H01M 10/0568** (2010.01)

CPC (source: CN EP US)  
**H01M 4/131** (2013.01 - CN); **H01M 4/134** (2013.01 - US); **H01M 10/052** (2013.01 - CN); **H01M 10/0525** (2013.01 - EP US); **H01M 10/0567** (2013.01 - CN EP); **H01M 10/0568** (2013.01 - CN); **H01M 10/058** (2013.01 - CN); **H01M 10/0587** (2013.01 - US); **H01M 10/4235** (2013.01 - CN); **H01M 2004/027** (2013.01 - US); **H01M 2300/0025** (2013.01 - EP); **Y02E 60/10** (2013.01 - EP); **Y02P 70/50** (2015.11 - EP)

Citation (search report)  
• [XY] US 2015236379 A1 20150820 - WIETELMANN ULRICH [DE], et al  
• [Y] JP H09293508 A 19971111 - SONY CORP  
• See references of WO 2021039241A1

Designated contracting state (EPC)  
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

DOCDB simple family (publication)  
**EP 4024508 A1 20220706**; **EP 4024508 A4 20221228**; CN 114375518 A 20220419; JP WO2021039241 A1 20210304; US 2022359904 A1 20221110; WO 2021039241 A1 20210304

DOCDB simple family (application)  
**EP 20857673 A 20200728**; CN 202080059949 A 20200728; JP 2020028819 W 20200728; JP 2021542650 A 20200728; US 202017638500 A 20200728